

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
10 June 2004 (10.06.2004)

PCT

(10) International Publication Number
WO 2004/049026 A1

(51) International Patent Classification⁷: **G02B 6/28**

(21) International Application Number:
PCT/GB2003/005190

(22) International Filing Date:
27 November 2003 (27.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0227585.7 27 November 2002 (27.11.2002) GB

(71) Applicant (for all designated States except US): **AVANEX UK LIMITED** [GB/GB]; Starlaw Park, Starlaw Road, Livingston EH54 8SF (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BULTHUIS, Hendrick, Freerk** [NL/NL]; Avanex UK Limited, Starlaw Park, Starlaw Road, Livingston EH54 8SF (GB). **VLIET, Marcel, Frederik van der** [NL/NL]; Avanex UK Limited, Starlaw Park, Starlaw Road, Livingston EH54 8SF

(GB). **BEELEN, Gunter** [NL/NL]; Avanex UK Limited, Starlaw Park, Starlaw Road, Livingston EH54 8SF (GB). **PANDAVENES SUAREZ, Jamie** [ES/ES]; Avanex UK Limited, Starlaw Park, Starlaw Road, Livingston EH54 8SF (GB).

(74) Agent: **URQUHART-DYKES & LORD**; Tower North Central, Merrion Way, Leeds LS17 7HN (GB).

(81) Designated States (national): CN, JP, US.

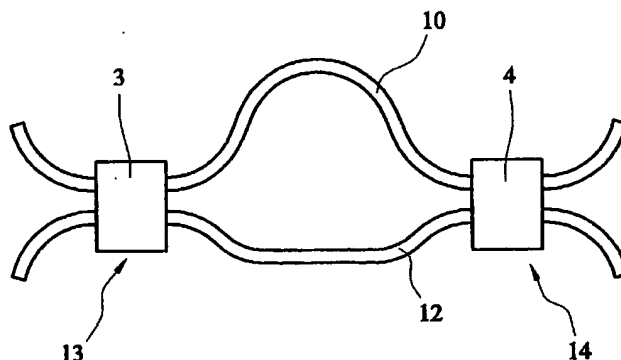
(84) Designated States (regional): European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **OPTICAL BRANCHING COMPONENT WITH LOW POLARISATION SENSITIVITY AND INCREASED PROCESS TOLERANCE**



(57) Abstract: An optical branching component particularly suitable for use as a tap device is described. The component has two optical waveguides coupled between two optical couplers which each include at least one MMI supporting at least two guided modes. There is an effective optical path length difference between the two waveguides and the coupling strength of at least one of the couplers monotonically decreases with increasing wavelength in the operational wavelength region of the component. This means a coupler with relatively large coupling strength and relatively low polarisation dependency can be used in the component, giving low polarisation dependent variation in the tap ratio, particularly for small tap ratios. Moreover, the use of MMIs in the couplers avoids the need to fabricate to a high process tolerance very small gaps between two waveguides, as can be the case with directional couplers used in prior art branching component designs.

WO 2004/049026 A1

EXPRESS MAIL NO. EV 314047329 US